REMARKS:

Claims 1-28 were filed in the original application. Claims 1-13 have been cancelled, claims 14, 21, and 27 have been amended, and new claim (29) added by the Preliminary Amendment filed on 10/12/05 and subsequently entered by the Examiner. Hence, claims 14-29 currently are pending.

The Examiner objected to the Information Disclosure Statement because a concise explanation of the relevancy of the non-English language references EP 356,896, EP 470,116, and EP 664,715 was missing. Hence, a supplemental IDS including said explanation is being submitted herewith, along with the fee under 37 CFR 1.17(p). The applicant believes that these references are now ready for consideration by the Examiner and further believes that none are material to patentability.

The priority claim has been amended to delete the incorrect statute citation. Moreover, claim 20 has been amended to recite "peracetic" rather than "paracetic" acid. The undersigned thanks the Examiner for inviting the correction of these informalities.

Claims 14-29 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention. In particular, the term "high-level" disinfection in claims 14, 21, and 27 was deemed to be indefinite. However, "high-level" disinfection is defined in the art as disinfection that kills all organisms except high levels of bacterial spores. See Declaration of Langford at ¶7, Exhibit 1 thereto from the Food and Drug Administration (1993) (page 4, item 8), and Exhibit 2 thereto from the Centers for Disease Control (page 1, paragraph 2).

Hence, the applicant believes that the claims are in compliance with 35 U.S.C. 112 because "high-level" disinfection was known to one of ordinary skill in the art at the time the invention was made.

Claims 21-29 were rejected under 35 U.S.C. 102(b) as being anticipated by Guess (WO 02/32467). Of these claims, numbers 21 and 27 are independent. Claim 21 recites a method of preventing re-contamination of a cleaned and high-level disinfected item, comprising:

a. rinsing said cleaned and high-level disinfected item with water; and

b. flushing said item with ozone.

Similarly, claim 27 recites "a method of preventing cross-contamination of components within a sterilizing apparatus" that involves flushing the components with ozone upon completing the high-level disinfection of an item placed in the apparatus. Thus, claims 21 and 27 are directed to post high-level disinfection rinses that are performed to prevent cross- or re-contamination.

In contrast, the Guess reference describes an apparatus for cleaning and disinfecting medical equipment through flowing ozonated water over the equipment surfaces. In the passages cited by the Examiner on page 7 of the Office Action, it is clear that Guess' method utilizes filtered water to wash the medical equipment, followed by ozonated water for disinfection. For example, the Abstract of Guess states, in relevant part, "An apparatus...for delivering first a flow of filtered water over the surfaces of the equipment to be cleaned...followed by a flow of ozonated water over said surfaces...to disinfect the surfaces." Similarly, lines 25-29 of page 7 state that rinse water and ozonated water are used to disinfect. Accordingly, there is no disclosure of a method in which high-level disinfected items subsequently are rinsed with

water and then ozone. Moreover, there is no disclosure in Guess that is directed to rinsing components of his sterilizing apparatus with water and ozone after an item has been high-level disinfected. The need for such methods clearly still exists (see Declaration of Langford at ¶9 and Exhibit 3 thereto, especially at ¶3 on page 1 and page 4, ¶7 through page 5, ¶3).

Since the Guess reference does not disclose or suggest claimed contamination-prevention method steps, which occur after high-level disinfection, claims 21 and 27, as well as all claims depending therefrom, cannot be anticipated.

Claims 14-20 were rejected under 35 U.S.C. 103(a) as unpatentable over Langford (U.S. Patent No. 5,443,801; hereinafter the '801 patent) in view of Hichems et al. (U.S. Patent No. 6,468,953). It is well understood that three basic criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The applicant respectfully traverses the contention that any of these three criteria has been met.

The '801 patent generally discloses a cleansing/sterilizing apparatus for sterilization of various complex and reusable medical and dental instruments (Abstract). More specifically,

the '801 patent's apparatus washes with detergent dissolved in purified water, rinses by means of purified water, sterilizes by means of ozonated and purified water, and dries by means of "ozonated/deozonated sterile warm dry oxygen or a sterile inert gas" (col. 3, lines 47-51).

As correctly stated by the Examiner at page 5 of the Office Action, the '801 patent does not teach the specific amount of ozone in the water, does not teach the use of a chemical sterilizing agent (such as peracetic acid), and does not teach the specific process steps including treating an item with a chemical sterilizing agent to achieve high-level disinfection as recited by the instant claims. Moreover, according to the teachings of the '801 patent, the use of ozone is always related to the primary sterilization step that takes place just after an item is cleaned and rinsed (again, col. 3, lines 47-51, states: "The apparatus washes by means of detergent dissolved in purified water, rinses by means of purified water, sterilizes by means of ozonated and purified water, and dries by means of ozonated/deozonated sterile warm dry oxygen, or sterile inert gas."). The '801 patent does not, however, disclose or suggest an "overkill rinse" of an *already cleaned and high-level disinfected* item; instead the item is dried after the sterilization step. While the Examiner contends on page 8 of the Office Action that the disclosure at column 21, lines 45-50, in the '801 patent of the repeated rinsing of an endoscope with ozonated water *suggests* an "overkill rinse," the applicant submits that the repeated rinsing is to effect sterilization, not to provide a final chemical-degrading and biomatter "overkill" rinse of first water and then ozone for an already high-level disinfected item as recited in steps e) and f) of claim 14. Moreover, one of ordinary skill in the art would not take the '801 patent's repeated rinsing with ozonated water to suggest a separate chemical degradation and biomatter "overkill" rinse because no chemical sterilant is used in the '801 patent's disclosed method. See Declaration of Langford at ¶10.

The applicant also submits that there would be no motivation to combine the '801 patent and Hitchems et al. reference because the '801 patent specifically teaches away from the use of "corrosive chemicals" (col. 3, line 27) by stating that "None of the current state of the art devices [i.e., heat, chemical, or saline and water] can achieve these results without damaging the contact lenses or producing harmful effects to the eye." Indeed, the reason why the '801 patent exclusively teaches the use of ozone for sterilization (as opposed to chemical sterilants) is to avoid the use of corrosive chemicals: "The apparatus avoids the use of heat, pressure, severe agitation, or corrosive chemicals which might damage delicate equipment" (Abstract). While ozone is a strong oxidant, its effects are short-lived ("...ozone has a very short life, usually about twenty minutes. As the ozone breaks down, its natural by products are pure water and stable oxygen," col. 6, lines 31-34). In contrast, chemical sterilants remain active and must be thoroughly removed. This is why the '801 patent avoids the use of any sterilant other than ozone.

Nonetheless, even if one were motivated to combine the '801 patent with Hitchems et al., the rinsing steps e) and f) of claim 14 would not be disclosed. This is because the chemical sterilants of Hitchems et al. would take the place of the ozone rinse for the sterilization step taught by the '801 patent. While one of ordinary skill may have thought to then rinse the items after a chemical sterilant is used, there is no suggestion or disclosure to rinse the items with water and then with ozone as recited in claim 14 by the applicant. Thus, the prior art references do not teach or suggest all the claim limitations.

In addition to the analysis and remarks presented above, there is objective evidence, such as unexpected results, long-felt need, failure of others, and skepticism of experts, that is relevant to the issue of obviousness in this case.

Unexpected Results

Most medical devices sold in the United States today are cleared for commercial distribution or marketing by premarket notification. The Federal Food, Drug, and Cosmetic Act (FD&C Act) requires device manufacturers to submit a premarket notification (i.e., a "510(k)") to the FDA if they intend to introduce a device into commercial distribution for the first time, or to introduce--or reintroduce--a device that will be significantly changed or modified to the extent that its safety or effectiveness could be affected.

The applicant's claimed methods are so unexpectedly effective (> 6 log reduction of microbial loading with no colony forming units (CFU's) and < 6.4 ug/cm^2 protein remaining after cleaning), that the FDA now defines the high-level disinfecting standards used for testing washer/disinfector devices as the "Langford IC Systems (LIC) Requirements" (Declaration of Langford at ¶11 and Exhibit 4 thereto at page 3, ¶5.3). In other words, parties who submit 510(k) notifications for new or modified washer/disinfectors employing chemical disinfection must pass the high-level disinfection standards set by the applicant's methods. If the applicant's claims were simply a matter of routine skill, surely another in this highly competitive field would have achieved similar results, and, thus set the FDA standard above prior to the applicant.

Long Felt Need

That these claims do not recite an obvious variation on the '801 patent and Hitchems et al.'s inventions is further demonstrated by the fact that, despite the existence of numerous cleaning and sterilizing apparatus and methods for reusable items, ensuring that cleaned and sterilized items (especially medical scopes) are contaminant free remains an issue. Such has been underscored by an article published after the applicant's filing date entitled *Germ Watch: Clinical Infections Put a Sterilizer of Lab Devices Under Microscope* (see Declaration of Langford, Exhibit 3). This article describes a fatal outbreak of bacterial infection that was linked to a failure to decontaminate hospital bronchoscopes. As stated by the author on page 1, last paragraph, "The disputes about Steris underscore a persistent issue facing hospitals and outpatient clinics that use endoscopes for surgery or examinations...every year or so a facility reports an infectious outbreak among a cluster of patients who had endoscopic procedures."

The contaminants typically found on tubular medical items, such as endoscopes, are especially difficult to remove. In addition to fecal mater, loose cellular debris, blood and blood products, viruses, and bacteria, an endoscope can be coated with various hydrophobic films, such as "biofilm" material. A biofilm typically comprises cells, both dead and alive, cell debris and extracellular polymer substances. Once biofilm is formed by microorganisms (including bacteria, fungi, and protozoans), these microorganisms can colonize and replicate on the interior surfaces of tubing, forming a protective slime layer known as a "glycocalx" that is especially difficult to remove. Thus, the fact that the applicant's methods have set a new standard for 510(k)-related testing in the field of washer/disinfectors indicates that a long felt need is being addressed. Even more recently, the FDA began the process of defining a new category of reprocessing devices known as a "cleaner/processor." The cleaning and

disinfecting standards required by this category of devices are being defined by the applicant's methods and devices (see Declaration of Langford at ¶13).

Skepticism of Experts

While many medical instruments today are routinely cleaned, disinfected, and reused, experts in the field have warned that some of the more difficult to clean and sterilize medical items are putting people at risk. See ¶14 of Declaration of Langford.

Indeed, one expert has stated that there are no independent published reports or data anywhere in the medical literature that show liquid chemical sterilants (or any other method/process/agent) can be used to reliably "sterilize" flexible endoscopes or other complex, lumened instruments (See Comments by L. Muscarella (Custom Ultrasonics) on AAMI TIR7:1999, *Chemical Sterilants and Sterilization Methods: A Guide to Selection and Use*, submitted herewith as Exhibit 5 of Declaration by Langford). Hence, there has been a skepticism in the field generally regarding the ability of washer/disinfection devices to reliably produce contamination-free performance. The applicant's claimed methods address this skepticism about the purity of water used to rinse and degrade chemicals in and on items processed in a washer/disinfector apparatus.

Failure of Others

Even the simple act of rinsing medical items with *filtered* water after cleaning or sterilization has been called into question. After sterilization, endoscopes typically are rinsed with water filtered down to the 0.2 micron (200 nanometer) level. Unfortunately, many viruses, endotoxins, and prions are smaller than 200 nanometers, meaning that they can remain in the

water even after filtration. Also, as reported in the articles mentioned above, water and water filters are known sources of contamination. Even more troubling, however, is the statement by one expert that "there are no independent data in the medical literature that support the production of sterile water (defined as containing fewer than 10^{-6} CFU/ml and fewer than 5 endotoxin units/ml) by passing unprocessed water (that is, un-sterilized water, such as water that flows though a hospital's tap) through a bacterial (e.g., 0.1 or 0.2 micron) filtration system" (See Exhibit 5 to Declaration of Langford).

The FDA recently has created a new category of reprocessor device known as a "cleaner/processor." The cleaning and disinfection standards associated with this category are based on the applicant's test results and includes the following: A single chamber device should be capable of cleaning an instrument to a residue level of < 6.4 μg/cm² of protein from a bio burden of at least 300 μg/cm² of protein, achieve the high-level disinfection of an instrument contaminated with horse serum and 7 logs of *Mycobacterium terrae* to a SAL of >6 with no surviving CFU's, have an integrated rinse water system capable of producing a sanitized rinse water from water contaminated with 7 logs of *Staphylococcus aureus, Bacillus subtilis, Pseudomonas aeruginosa and Candida albicans*, and be able to rinse off germicide residue without compromising the integrity of the high-level disinfection process. No other party has yet to achieve these results as reported in an FDA submission. Indeed, because the water used to rinse high-level disinfected items must itself be at least at that level of disinfection, the applicant is believed to be the first to develop an integrated rinsing system that produces a sanitized water to rinse off the germicide residue from the surfaces of the medical item without compromising the integrity of the disinfection process. See Declaration of Langford, ¶13.

Expectation of Success

One pages 6 and 7 of the Office Action, the Examiner contends several times that the combination of the '801 patent with the Hitchems et al. reference would have a reasonable expectation of resulting in the applicant's invention. The unexpected results, long felt need, skepticism of experts, and failure of others described above clearly demonstrate that ample uncertainty has existed in the field prior to the applicant's invention.

In view of the foregoing, the applicant respectfully submits that the claims of the present invention are both novel and unobvious in view of the cited art.

Except for the fees due with the IDS submission and a two-month extension of time, no fee is believed to have been incurred for this amendment. Should there be any unforeseen costs, please charge our Deposit Account No. 17-0055.

Respectfully submitted,

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